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Internet Diffusion and Adoption in Cuba

Abstract

The purpose of this paper is to examine Internet adoption at a time of increasing change for the Cuban marketplace. As the Cuban economy begins to open to new business formats one key driver of economic growth will be access to communications networks. This paper explores the penetration of Internet connectivity in Cuba as relations with the United States thaw. The theories of diffusion of innovations, cultural dimensions of adoption and market and political realities are employed to better understand the pace of Internet adoption as the Cuban economy continues to develop.

Keywords: Cuba, Internet Adoption, Emerging Economy, Marketing

Introduction

Cuba is one of the last countries in the world to provide online access for its citizens in spite of the economic advantages that connectivity brings to economies. As the country opens opportunities for citizens to engage in business and potential trade with the United States grows the Internet could help boost economic output for the country.

Around the world the Internet has become a conduit for commerce, connections among diverse groups of people and a means of dispersing shared cultural experiences. However, people in the developing world lag behind in online access due to economic, political, infrastructure and censorship limitations. Whereas over 3 billion people have access to the Internet, 58% or 4.2 billion people are not connected, particularly within the developing world (West 2015).

According to the Committee to Protect Journalists, the top most censored countries include Eritrea, North Korea, Saudi Arabia, Ethiopia, Azerbaijan, Vietnam, Iran, China, Myanmar and Cuba (Committee to Protect Journalists 2015). Other barriers to the internet include high device, data and telecommunications costs, lack of fiber optic lines, cell towers, routers and reliable electricity and monopoly telecom providers, tech sector taxes and limited content in the country's language (West 2015). In Cuba the government controls the Internet and the authorities restrict access at will and during times of increased political stress. In spite of the control the Cuban government has announced pilot projects to offer broadband services in Havana provided by the Chinese company, Huawei. Though access will remain limited, the move indicates that the Cuban government may be more open to providing access, but with significant limitations. To support the efforts the US government has removed limitations on US telecom companies expanding to Cuba (BBC News 2016).

This research examines Internet penetration in Cuba as the country begins to open access to wireless services throughout the country. We examine the current state of online and social media access and consider the trajectory of adoption based on factors that predict diffusion of digital innovations.

Current State of Internet Penetration in Cuba

Cuba has remained relatively isolated from technological advances as a result of the embargo, government policy and economic limitations. Though most developing countries have embraced cellular technology and average citizens have access to mobile technology, Cubans have not had the same opportunities. Less than 5% of Cuba's population has in-home Internet access, though about 25% have used the Internet and 23% have access to Cuba's state controlled intranet (Scola

2014). According to the International Telecommunication Union Internet penetration was 30% in Cuba in 2014, up 28% over 2013 (International Telecommunications Union n.d.). However, these figures include Cuba's government run intranet that does not have international access to sites and information. In spite of the limitations, Cuba's Internet has seen a tripling of .cu names between 2012 and 2014 according to Cuba's National Statistics Office (Freedom House 2015).

In 2015 Cuba began to increase Internet opportunities for citizens and by spring of 2016 there were 40-60 government approved Wi-Fi hotspots with web access around the country. These access points in parks and centers had faster connection speeds than most of the population had seen before. Originally Cubans paid \$4.50 an hour for Internet time through ETECSA (Telecommunications Company of Cuba S.A.). However, by the summer of 2015 people could access online communications using codes purchased on scratch-off internet "Nauta" cards for \$2.00 an hour. The cards could be used at specified locations with temporary accounts valid for 30 days from the first session. Permanent accounts were also permitted upon request with user names and passwords, though closely monitored by ETECSA (Freedom House 2015). This move opened up communications for more people and Freedom House estimates that 150,000 Cubans now have some Internet access. The total number of Internet users grew 100% between 2014 and 2015 and now represents about 13% of the total population of Cuba of about 11 million people (Freedom House 2016). However, only those with the devices, incomes and desire use the service. Often these elite users have access to relatives outside the country who provide equipment and money to access these services.

The types of communications in Cuba follow a pattern that matches the trajectory for other developing countries in which Internet access is expensive and scarce. People in Cuba seem

most interested in connecting with loved ones overseas. Eduardo, a Cuban living in Cienfuegos used Internet access to video chat on Imo with his wife who was teaching economics in Angola. To do so he shared Internet access with 3 other friends, each paying 50 cents for 15 minutes of Internet usage. Others in parks could be seen chatting with people on their devices. Adults are already complaining about kids on cell phones chatting all day through their University systems.

Cubans' Experience with Connectivity

The excitement over connectivity in Cuba is evident in parks in cities where Wi-Fi is available. When given the opportunity adoption among Cubans is likely to be dependent more on access to equipment and money than in knowledge of how to use services. In spite of the lack of Internet access Cubans have found other means of connecting, such as borrowing tourists' hotel wireless access codes or using equipment brought by relatives to patch into wireless. Cuba also has a community network called Street Net (SNET). Started in 2001 the SNET is a 30-kilometer network of 9,000 computers with small hidden Wi-Fi antennas and Ethernet cables across streets and rooftops across Havana (Estes 2015).

The SNET has strict rules for engagement limiting political, religious and sexual content, but does allow some social networking, file transfers, streaming music and forums for developers, engineers, sports and art and literature (Press 2016). There are multiplayer online games and chat rooms for people to connect and plan events (Weissenstein 2015).

The most popular method for distributing information around the island of Cuba is “The Package” or “El Paquete.” Believed to be the largest employer in Cuba the illegal “sneakernet” is a USB key of content that is shared for 5 CUC (convertible Pesos) or about \$6.50. El Paquete

contains television programming, music, movies, magazines, news and even an Excel spreadsheet with items for sale. Cubans gain access when a delivery person drops off a USB key fully loaded and returns the next day to pick it up with payment (Marshall 2016). Though illegal, the service allows Cubans to have access to programming from Univision and HBO and magazines such as OK! and Cosmopolitan.

Cubans also have experience in using Cuba's government intranet. Though limited, the system provides email; some government approved web sites, educational materials and an encyclopedia (Scola 2014). Access has been available in government run centers, state run cybercafés and in school computer labs (Freedom House 2015). However, students have limited time for browsing, even in medical schools. For example, students in Havana University's special Journalism course have 40 MB of data access per month (Freedom House 2015).

As early as 2011 Cuba created its own social network called RedSocial aimed at academics and students as part of the government-run intranet. The platform used the URL: facebook.ismm.edu.cu. to highlight the connectivity of the system (Torba 2011). However, the site was heavily monitored by the government and had limited access time for users. As a result the experiment was short lived and RedSocial is no longer available.

The Cuban government grants Internet usage to a select group of intellectuals trusted by the government, doctors and party officials. Access is via an undersea cable between Cuba and Venezuela controlled by two state owned Internet service providers: The Center for Automatic Interchange of Information (CENIAI) and ETECSA (which also owns the only mobile carrier Cubacel) (Freedom House 2015).

Most Cubans still have limited access to the Internet due to high costs for connecting. Rather than rely on complex filtering mechanisms the government limits access to technology with relatively high costs. When able to purchase access time people can view some international news sites such as the BBC, El Pais, the Financial Times and El Nuevo Herald (from Miami), but independent news sites are restricted. In addition tourists have Internet access so locals have had opportunities to see the web in action (Henken, Celaya and Castellanos 2013) and are familiar with the concept of online connectivity (Franceschi-Bicchierai 2014). Cubans, particularly younger residents of the capital are reported to be as technologically competent as their peers in other countries as a result of ingenuity and creeping access to technology including iPhones and privately run mobile phone stores (Guardian 2015).

Greater access to the Internet would open up more opportunities for the people to earn hard currency. For example in the tourist sector people who rent out rooms in their homes (casas particulares) with full government approval could book and manage reservations and compete with hotels. Other small businesses could use Internet connections to build clientele.

Economic Opportunities and Internet Penetration in Cuba

From an economic standpoint Internet access is important for development. Research across countries suggests that the Internet positively influences trade and therefore economic growth – particularly for lower income countries (Meijers 2014). The Cuban government has allowed people to buy computers since 2008 and approximately 10% of the population has them. The government has promised to increase mobile Internet connections by 60% through 2020 (Freedom House 2015).

In the period following the fall of communism, Cuba suffered severe deprivation. However, the situation for the average citizen has improved due to a number of governmental policies opening up the country to increased tourism, small business and local products.

By 2013 the per capita gross domestic product on the island was \$6789.8 (USD) (World Bank 2014), the agricultural index was at 100 and the food production index was 101, all significantly higher than in 2005 (UNdata 2014). Most Cubans participated in the workforce (43.4% of women and 70% of men), but earned very low incomes paid in local currency. However, though the economy is improving, the average monthly salary in Cuba continues to be only \$20-\$25 dollars (Tummino 2016).

Cuba's per capita GDP is comparable to Ecuador (\$6051.6), Montenegro (\$7186.4), Serbia (\$6353.8) and Peru (\$6603.8). However, these economies have available Internet access for larger proportions of the population and more available goods for purchase. The chart below shows data on population, total GDP, the percentages of homes with computers and the number and percentage of mobile subscribers for the countries with similar per capita GDPs. The glaring difference in the chart is the limited number of cell phones in Cuba as compared to the other countries. Though many people in the developing world do not have household computers due to cost, they do have cell phones with which to communicate and connect. This is one area where Cuba lags behind. In a study of Sub-Saharan Africa, Donou-adonsou, Lim and Mathey (2016) found that a one percent increase in Internet and mobile usage rates increases growth by .12 and .03 percentage points (Donou-adonsou, Lim and Mathey 2016). However, even limited information technologies affect growth. For example, a study of industrial companies in Ecuador found that only 11% of companies had Internet access in 2010, but those that did had higher levels of sales and profits as a result (Penaloza and Avella 2014).

	Population	GDP	% Households with Computers	Mobile Cellular Telephone Subscriptions	Mobile Cellular Subscriptions per 100 population
Cuba	11.8 million	\$77.15 billion	12.9 (2013)	2,530,752	22
Serbia	7.129 million	\$43.87 billion	NA	9,344,977	122
Peru	30.97 million	\$202.6 billion	30.9 (2013)	31,880,043	104
Ecuador	15.9 million	\$100.9 billion	35.7 (2012)	16,605,737	104
Montenegro	621,800	\$4.588 billion	51.3 (2011)	1,013,296	163

(World Bank 2014), (International Telecommunications Union n.d.)

From a cultural standpoint life in Cuba is difficult because the basic necessities of life are not widely available. Cubans earn very low salaries and rely on remittances from relatives overseas. Pertierra (2011) characterizes daily life in Cuba as “una lucha” or a daily battle to obtain necessary commodities such as cooking oil, soap and televisions due to the absence of available products. Stores outside of Havana do not exhibit a variety of items and the ability to cook, clean, repair or use items must be obtained creatively. The ingenuity can be seen in the many repaired items for use in Cuba, most exemplified by the famous automobiles from the pre revolutionary period.

Cuba operates a dual currency economy. The local population is paid in pesos and the tourist economy operates on a convertible currency called CUCs. Many Cubans live on pesos without access to the tourist currency and were not permitted to even use the CUCs until 1993. Though not wealthy the population has their basic needs met through rations, keeping animals or selling goods to others in the community. Often Cubans work multiple jobs to earn enough to start businesses or give a bit more to their families. Those with access to tourists have more

opportunities to earn cash to afford products. Within and between households there is a significant amount of trade and sharing among families to help bridge the consumption gap. For instance, relatives from the country may bring fruits and vegetables to the city for relatives, those with remittances may share with family and people with access to hard currency may purchase items for relatives who may need them. The clear conclusion from Pertierra's (2011) interviews with Cubans is that for most people the salaries do not cover the needs for goods and services leading people to seek additional means of income (Pertierra 2011).

Beginning in 1993 Castro allowed remittances to enter Cuba and in 2012 Cuban exiles sent \$2.6 billion (Morales 2013) and an additional \$2.5 billion in products and in-kind donations. In 2013 cash remittances grew to \$3.6 billion (Havana Consulting Group 2014). These payments represent the most important single source of revenue for the nation. Today, remittances reach an estimated 62 percent of Cuban homes, sustain nearly 90 percent of the country's retail market and favor the employment of tens of thousands of people.

The remittances provide desired products and services among those who receive them. Nearly 70 percent of Cuba's mobile phone market, with over 1.6 million cellular phones currently in service, is also financed by Cuban émigrés (Morales 2013).

Another key element of Cuba's economy is tourism. In 2014 a little more than 10% of Cuba's total GDP was a result of direct, indirect and induced tourism as estimated by the World Travel and Tourism Council (World Travel and Tourism Council 2015). By 2025 12% of Cuba's GDP is expected to be earned through tourism. In 2015, Cuba hosted 3.52 million visitors, up 17.4% over 2014. Visits by Americans grew 77 percent to 161,000, not counting the hundreds of thousands of visits by Cuban-Americans (Hamre 2016). Tourists help promote relations

overseas and provide opportunities for the Cuban government to earn hard currency. Tourists share both money and information with locals who have had the opportunity to see Internet usage in action.

The Cuban government continues to enact policies designed to open opportunities for the population albeit rife with regulations, licenses and rules that Cubans have learned to maneuver. Since the 1990's more small businesses have opened on the island providing much needed hard currency. Starting in the 1990's Cubans could obtain self-employment licenses to perform jobs such as cobbler, mechanic, artist or plumber. Some Cubans opened small (12 seat maximum) restaurants called "Paladares" or rented out rooms in their homes to tourists. In the early 2000's the CUC, a convertible currency used by tourists, could be obtained by locals to purchase items on the island. The currency was first pegged to the dollar, but switched to the Euro and Cuba imposed a 20% penalty for converting dollars to CUCs. In August 2015 a 15% penalty was imposed for US dollar-CUC exchange benefitting the Cuban government.

Cuba represents a culture that has largely lived apart from the signs and symbols of consumption. The island lacks a robust market economy, prominent messaging and advertising of brands and widespread Internet connectivity. One potentially influential aspect of consumption behavior is Internet adoption. Though ecommerce is not likely an opportunity for Cubans in the near future, access could influence attitudes and behaviors under current market conditions. The widespread attention to the Arab spring and the role of the Internet has given the Cuban government a reason to limit access to citizens, providing a strong potential barrier to adoption.

Patterns of Internet Adoption

In the United States and other wealthy nations the Internet was built on a set of wired connections through fiber optic cables. For the past 20 years the wired Internet has served to connect people around the world. According to the World Bank 88% of US and UK, 81% of French and 83% in Germany citizens have Internet access for example.

With the introduction of the internet in the United States optimists predicted radical democracy connecting small special interest groups, but not large political movements. Though more people could participate in open discourse the level of clutter limited what was heard both politically and commercially (Ess 2001). In the U.S. the promise of democracy led to increased consumerism with the growth of internet commerce, additional avenues for marketing communications and a variety of influences on purchase behavior. In a materialistic society like the U.S. increased consumption was not surprising. Cubans may react differently and have already been showing a proclivity toward using the Internet for communications, rather than mass consumerism due, in part, to culture and the lack of opportunity to buy online.

Culture can be defined as transmitted patterns of meaning represented in symbols through which people communicate and “develop their level of knowledge and attitudes toward life” (Geertz 1973). Researchers have studied the concept there is no universal agreement on the manifestations of culture, though culture along with economic and political factors could influence Internet adoption. Three cultural requirements for diffusion of internet usage across countries are: uncertainty avoidance, gender equality and English language ability. These prerequisites will be explained as they relate to potential Cuban Internet adoption.

Uncertainty Avoidance: One of the most widely discussed theories for categorizing cultures across countries is Hofstede's Cultural Dimensions (Hofstede 1983). There are five dimensions, but the one that has been most strongly tied to internet adoption is uncertainty avoidance, defined as the extent to which people within a culture feel threatened by new unknown situations. In countries with low uncertainty avoidance motivation for action comes from achievement, esteem or belongingness with acceptance of diverse ideas. In countries with high uncertainty avoidance, people resist innovation, are more comfortable with security and are less accepting of new ideas. They tend to have lower expected rates of technology adoption (Maitland and Bauer 2001).

High in uncertainty avoidance, Cubans are not expected to adapt quickly to change or innovation. The strictly enforced rules allow the government to control access to communications. Internet adoption is likely to be slow as a result of government control, and economic limitations, as much as uncertainty avoidance. However, there are certainly early adopters who have embraced the Internet. These early adopters will help with the diffusion process by displaying their usage publicly – as in parks and outside wireless sites and by sharing with family and friends. The factors that lead to adoption and diffusion such as observe-ability and trial-ability have already grown as a result of the outdoor display of Internet users in parks. The likelihood that such behaviors will become lifestyle compatible will depend on the continued availability of access. Once Cubans see the advantages of not only connecting with family around the world, but with information and business opportunities, adoption will grow. As previously mentioned urban young adults are already Internet savvy.

Granovetter (1973) suggests that weak ties among members of a social network facilitate the diffusion of influence and information leading to larger scale social change (Granovetter 1973).

The opportunity for people to share information about Internet usage and access in public spaces in Cuba increases the likelihood of adoption. When individuals who are not closely related to one another discuss the Internet options and processes, diffusion is lubricated such that more people become aware of the benefits of online access.

Gender Equality: The extent to which a culture allows women equal access to opportunities affects its level of innovation. Cultures that limit the ideas and work potential of half the population tend to lag in technological prowess (Herbig 1994).

Though there is not full equality for women in Cuba, for instance domestic violence is an issue, women do have equal access to work in all fields and the law requires equal pay. However, women remain the minority in traditionally male occupations and are overrepresented in “helping” careers such as teaching, the legal profession and medicine, while men dominate the hard sciences. In spite of that, more Cuban women are represented in engineering (24%) than in the US (11%) and hold 44% of the national legislative positions. Cuban women make up 80% of university students and 64% of college graduates. Though gender equality contributes to greater Internet adoption in some countries the effect in Cuba is likely minimal, again due to economic and political realities (American Association of University Women 2013).

English Language Barrier: Originally most content on the Internet was in English and as a result English language proficiency was a key driver of Internet adoption. However, today there are many more pages of content in Spanish. Though English remains the dominant online language representing 53.6% of Internet content, Spanish content represents 4.6% of pages, the fifth largest represented language online after Russian (5.9%), German (5.8%) and Japanese (5.0%)

(W3Techs.com 2016). As a result English language proficiency is no longer a prerequisite for internet adoption.

In examining the factors leading to Internet adoption Maitland and Bauer (2001) found that certain variables were associated with diffusion of the Internet between 1990 and 1995 as measured by host counts. Host counts reflect IP addresses of connected devices. The key factors the study found led to internet adoption were: newspapers per 100 population, GDP per capita, teledensity, gender empowerment, international call cost, school enrollment, PCs per 1,000 population and English language ability. These factors developed in 2001 are no longer necessarily the same in 2016. However, the variables can be predicted with the comparable factors of wireless access, cost of access, education and devices per capita. In Cuba wired access as a percentage of the population is less than 5% of the population (Freedom House 2015), the cost of access is high for the average person and there are few devices per capita. The only factor that predicts Internet adoption is the high level of education with literacy rates over 95% (UNdata 2014). However, without access, education does not lead to adoption (Maitland and Bauer 2001).

Conclusion

Cuba is an interesting case study of a country in which consumption and Internet communications are developing in tandem. In the developed world Internet penetration occurred in mature consumer markets with the support of the government and the funds for investment in technology and backbone. In the developing world, broadband Internet penetration was slow to develop, but often took place in market economies, many of which were supported by government initiatives. In poorer countries that were unable to build infrastructure mobile has

become the dominant technology for accessing the Internet. When mobile communications became available many residents in developing countries obtained access to a greater level of discourse and economic opportunities. These differences will lead to a unique set of consumption actions for the Cuban population as opportunities increase and communications links grow.

The results of this analysis suggest that Cuba is poised for Internet growth as long as the government continues to open access for residents. The Internet in Cuba blog by Larry Press suggests that the government may legitimize the SNET, the network that runs from Cotorro to Bauta that the government has chosen to ignore for the past 8 years (Press 2016). There are also reports of proposals from US and non US companies to build an Internet cable between Miami and Havana (Press 2016). In either case, the Cuban government has made moves toward increasing access.

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